

1 transmitting the continuous phase modulated signal,
2 receiving the continuous phase modulated signal,
3 [demodulating the continuous phase modulated signal into a
4 received baseband signal,] and
5 filtering the [received baseband] continuous phase modulated
6 signal into a sequence of filtered signals having absolute phase
7 for indicating the sequence of data symbols.

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9 2. (Once Amended) The method of claim 1 further comprising the
10 steps of ,

11 sampling the sequence of filtered signals into a sequence of
12 sampled [signals] symbols, and

13 [decoding] demodulating the sequence of sampled symbols
14 [signals] into an estimated data stream.

15
16 3. (Once Amended) The method of claim 1 wherein,

17 the generating step comprises the steps of receiving the data
18 stream of data bits, formatting the data stream into the sequence
19 of formatted data pulses as a sequence of data symbols within an M-
20 ary symbol set,

21 the modulating step comprises the steps of Gaussian filtering
22 and frequency modulating for generating the continuous phase
23 modulated signal, the Gaussian filter step filters the precoded
24 sequence of data symbols into pulse responses continuously
25 accumulated over a finite memory time as a filter response, the
26 Gaussian filtering step is defined by a bandwidth time product
27 inversely defining the finite memory time, the frequency modulating
28 step frequency modulates a carrier reference by the filter response

1 by a modulation index for converting the filter response into the
2 continuous phase modulated signal,

3 the [demodulating step is carrier demodulating step for
4 demodulating the] continuous phase modulated signal is up converted
5 from baseband during the transmitting step and is down converted to
6 baseband during the receiving step using a local carrier [into the
7 baseband signal, the carrier demodulating step further removes a
8 carrier phase offset between the local carrier and the received
9 continuous phase modulated signal], and

10 the filtering step is a matched filtering step for matched
11 filtering of the received [baseband signal] continuous phase
12 modulated signal into the filtered signal, the matched filtering is
13 matched by pulse amplitude modulation representation to the
14 Gaussian filtering step, the filtered signal has an absolute phase
15 at a periodic sampling time for indicating the sequence of data
16 symbols.

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18 4. (Twice Amended) The method of claim 3 wherein,

19 the modulation index is equal to a fraction selected from a
20 group consisting of $1/M$ and $(1-1/M)$ fractions for the M-ary symbol
21 set where $M=2^k$ and k is an integer.

22
23 5. (Twice Amended) A method for communicating a data stream, the
24 method comprising the steps of,

25 generating a sequence of data symbols from the data stream by
26 formatting the data stream into the sequence of formatted data
27 pulses as a sequence of data symbols within a 2-ary symbol set,

1 precoding the sequence of data symbols into a sequence of
2 precoded data symbols,

3 Gaussian filtering the precoded sequence of data symbols into
4 pulse responses continuously accumulated over a finite memory time
5 as a filter response, the Gaussian filtering is defined by a
6 bandwidth time product inversely defining the finite memory time,
7 frequency modulating a carrier reference by the filter
8 response by a modulation index for converting the filter response
9 into a continuous phase modulated signal,

10 [demodulating the continuous phase modulated signal by a local
11 carrier and by a carrier phase offset into a received baseband
12 signal,] and

13 matched filtering the received [baseband signal] continuos
14 phase modulation signal into a filtered signal, the matched
15 filtering is matched by pulse amplitude modulation representation
16 to the Gaussian filtering, the filtered signal has an absolute
17 phase at a periodic sampling time for indicating the sequence of
18 data symbols.

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20 11. (Twice Amended) A method for communicating a data stream, the
21 method comprising the steps of,

22 generating a sequence of data symbols from the data stream by
23 formatting the data stream into the sequence of formatted data
24 pulses as a sequence of data symbols within a[n] 4-ary symbol set,

25 precoding the sequence of data symbols into a sequence of
26 precoded data symbols,

27 Gaussian filtering the precoded sequence of data symbols into
28 pulse responses continuously accumulated over a finite memory time

1 as a filter response, the Gaussian filtering is defined by a
2 bandwidth time product inversely defining the finite memory time,
3 frequency modulating a carrier reference by the filter
4 response by a modulation index for converting the filter response
5 into a continuous phase modulated signal,
6 [demodulating the continuous phase modulated signal by a local
7 carrier and by a carrier phase offset into a received baseband
8 signal, and]
9 matched filtering the [received baseband signal] continuous
10 phase modulated signal into a filtered signal, the matched
11 filtering is matched by pulse amplitude modulation representation
12 to the Gaussian filtering, the filtered signal has an absolute
13 phase at a periodic sampling time for indicating the sequence of
14 data symbols, and
15 demodulating the sequence of data symbols into an estimate of
16 the data steam.

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AMENDED CLAIMS and REWRITTEN

1. (Once Amended and Rewritten) A method for communicating a data stream, the method comprising the steps of,
 - generating a sequence of data symbols from the data stream,
 - precoding the sequence of data symbols into a sequence of precoded data symbols,
 - modulating the sequence of precoded data symbols into a continuous phase modulated signal,
 - transmitting the continuous phase modulated signal,
 - receiving the continuous phase modulated signal, and
 - filtering the continuous phase modulated signal into a sequence of filtered signals having absolute phase for indicating the sequence of data symbols.

2. (Once Amended and Rewritten) The method of claim 1 further comprising the steps of ,
sampling the sequence of filtered signals into a sequence of sampled signals, and
demodulating the sequence of sampled signals into an estimated data stream.

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1 3. (Once Amended and Rewritten) The method of claim 1 wherein,
2 the generating step comprises the steps of receiving the data
3 stream of data bits, formatting the data stream into the sequence
4 of formatted data pulses as a sequence of data symbols within an M-
5 ary symbol set,

6 the modulating step comprises the steps of Gaussian filtering
7 and frequency modulating for generating the continuous phase
8 modulated signal, the Gaussian filter step filters the precoded
9 sequence of data symbols into pulse responses continuously
10 accumulated over a finite memory time as a filter response, the
11 Gaussian filtering step is defined by a bandwidth time product
12 inversely defining the finite memory time, the frequency modulating
13 step frequency modulates a carrier reference by the filter response
14 by a modulation index for converting the filter response into the
15 continuous phase modulated signal,

16 the continuous phase modulated signal is up converted from
17 baseband during the transmitting step and is down converted to
18 baseband during the receiving step using a local carrier, and

19 the filtering step is a matched filtering step for matched
20 filtering of the received continuous phase modulated signal into
21 the filtered signal, the matched filtering is matched by pulse
22 amplitude modulation representation to the Gaussian filtering step,
23 the filtered signal has an absolute phase at a periodic sampling
24 time for indicating the sequence of data symbols.

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1 4. (Twice Amended and Rewritten) The method of claim 3 wherein,
2 the modulation index is equal to a fraction selected from a
3 group consisting of $1/M$ and $(1-1/M)$ fractions for the M-ary symbol
4 set where $M=2^k$ and k is an integer.

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8 5. (Twice Amended and Rewritten) A method for communicating a
9 data stream, the method comprising the steps of,
10 generating a sequence of data symbols from the data stream by
11 formatting the data stream into the sequence of formatted data
12 pulses as a sequence of data symbols within a 2-ary symbol set,
13 precoding the sequence of data symbols into a sequence of
14 precoded data symbols,

15 Gaussian filtering the precoded sequence of data symbols into
16 pulse responses continuously accumulated over a finite memory time
17 as a filter response, the Gaussian filtering is defined by a
18 bandwidth time product inversely defining the finite memory time,

19 frequency modulating a carrier reference by the filter
20 response by a modulation index for converting the filter response
21 into a continuous phase modulated signal, and

22 matched filtering the received continuos phase modulation
23 signal into a filtered signal, the matched filtering is matched by
24 pulse amplitude modulation representation to the Gaussian
25 filtering, the filtered signal has an absolute phase at a periodic
26 sampling time for indicating the sequence of data symbols.

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1 11. (Twice Amended and Rewritten) A method for communicating a
2 data stream, the method comprising the steps of,
3 generating a sequence of data symbols from the data stream by
4 formatting the data stream into the sequence of formatted data
5 pulses as a sequence of data symbols within a 4-ary symbol set,
6 precoding the sequence of data symbols into a sequence of
7 precoded data symbols,
8 Gaussian filtering the precoded sequence of data symbols into
9 pulse responses continuously accumulated over a finite memory time
10 as a filter response, the Gaussian filtering is defined by a
11 bandwidth time product inversely defining the finite memory time,
12 frequency modulating a carrier reference by the filter
13 response by a modulation index for converting the filter response
14 into a continuous phase modulated signal,
15 matched filtering the continuous phase modulated signal into a
16 filtered signal, the matched filtering is matched by pulse
17 amplitude modulation representation to the Gaussian filtering, the
18 filtered signal has an absolute phase at a periodic sampling time
19 for indicating the sequence of data symbols, and
20 demodulating the sequence of data symbols into an estimate of
21 the data steam.

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